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09/641,035	08/16/2000	David Wallman	SUN1P275/P4783	3756

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BEYER WEAVER & THOMAS LLP
P.O. BOX 70250
OAKLAND, CA 94612-0250

EXAMINER	
KANG, INSUN	

ART UNIT	PAPER NUMBER
2193	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/641,035	WALLMAN, DAVID	
	Examiner	Art Unit	
	Insun Kang	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/15/2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 25-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 25-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed 12/15/2004.

2. As per applicant's request, claims 19-24 have been cancelled, claims 1, 2, 5, 9-12, 16, and 18 have been amended and claims 25-27 have been added. Claims 1-18 and 25-27 are pending in the application

Specification

3. The objection to the specification has been withdrawn due to the amendment to the Specification.

Claim Objections

4. The objection to claims 1-3, 13 and 26 has been withdrawn due to the amendment to the claims.

Claim Rejections - 35 USC § 112

5. The rejection to claims 1-18 has been withdrawn due to the amendment to the claims.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claim 27 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 27 is non-statutory because it is directed to a "virtual machine" without

recitation of a computer or a computer-readable medium embodying the program instructions. The claim merely recites a "virtual machine" that is disembodied arrangement so as to be called a "computer program" or compilation of facts, information, or data *per se;* without creating any functional interrelationship, either as part of the stored data or as part of the computing processes performed by the computer ("acts") or computer readable medium so as to enable the computer to perform the claimed program instructions as recited. Thus the claim represents non-functional descriptive material that is not capable of producing a useful result, and hence represents only abstract ideas. Therefore, the claim is non-statutory.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-18 and 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Walters et al. (U.S. Patent 5,768,593).

Per claim 1:

Walters discloses:

-obtaining a program instruction to be executed by the virtual machine ("instruction is executed by the interpreter," col 4 lines 1-4)

-determining whether the program instruction is a branch instruction ("a branch instruction flag that is set true only for qualifying instructions that are branch instructions," col 10 lines 11-36; col 5 lines 10-40)

-determining whether a basic block is present in a code cache when it is determined that the program instruction is a branch instruction, the basic block including code that represents the program instruction, the code cache being associated with the virtual machine ("the hash table to see if a corresponding native code block is already stored in the code cache," col 3 lines 34-64; Fig 2-5)

-executing the code included in the basic block when it is determined that the basic block is present in the code cache and the program instruction is a branch instruction ("If so, the native code block in the code cache is executed until an exit instruction in the native code block is encountered," col 3 lines 54-67; Fig 2-5).

Per claim 2:

The rejection of claim 1 is incorporated, and further, Walters teaches:

-when it is deterimned that the basic block is not present in the code cache, the method further

("if there is no corresponding native code block is in the code cache," col 3 lines 60-67)

-interpreting the program instruction (col 3 lines 60-67; col 4 lines 1-3; Fig 2-5)

-copying code corresponding to the program instruction into the code cache ("After the native code is generated, the resulting native code block is stored in the code cache, an entry for the stored code block is generated in the hash table," col 13 lines 5-30; Fig 2-5)

Per claim 3:

The rejection of claim 2 is incorporated, and further, Walters teaches:

-allocating space in the code cache for the code corresponding to the program instruction ("After the native code is generated, the resulting native code block is stored in the code cache, an entry for the stored code block is generated in the hash table," col 13 lines 5-30; Fig 2-5)

-providing the code corresponding to the program instruction with a label (col 10 lines 29-47; Fig 2-5).

Per claim 4:

The rejection of claim 3 is incorporated, and further, Walters teaches placing the label in a table of labels (col 7 lines 24-36; Fig 2-5)

Per claim 5:

The rejection of claim 2 is incorporated, and further, Walters teaches:

-searching through a table of labels to determine if a target associated with the program Instruction has a matching label in the table of labels ("hash table lookup procedure to look up the address of the entry point instruction in the hash table to see if a corresponding native code block is already stored in the code cache," col 7 lines 15-24; "The use of the code chunk map enables...to efficiently identify all code blocks in the code cache," col 8 lines 46-63; Fig 2-5)

Per claim 6:

The rejection of claim 2 is incorporated, and further, Walters teaches:

the program instruction is a bytecode, and wherein the bytecode is executed by an interpreter of the virtual machine ("it is determined that the entry point instruction is one of a predefined set of non-native instructions to be executed by an interpreter, then that instruction is executed by the interpreter," col 3 lines 65-67; col 4 lines 1-3).

Per claim 7:

The rejection of claim 2 is incorporated, and further, Walters teaches:

the code cache is a native code cache, and the code corresponding to the program instruction is native code("the native code block in the code cache is executed until an exit instruction in the native code block is encountered," col 3 lines 54-67)

Per claim 8:

The rejection of claim 1 is incorporated, and further, Walters teaches:

the program instruction is a bytecode ("non-native code,"col 3 lines 35-44) and the code cache is a native code cache ("native code block in the code cache," col 3 lines 55-60)

Per claim 9:

The rejection of claim 1 is incorporated, and further, Walters teaches:

-interpreting the bytecode when the determining deterinesthat the program instruction is not a branch instruction(col 3 lines 60-67; col 4 lines 1-3)

Per claim 10:

The rejection of claim 1 is incorporated, and further, Walters teaches:

-computing a target using the program instruction, wherein the determining of whether

the basic block is present in the code cache includes determining if the code cache includes any basic blocks which correspond to the target (col 5 lines 10-40; col 7 lines 24-63; Fig 2-5).

Per claims 11-14, these are the computer program product versions of claims 1-4 and 8, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-4 and 8 above.

Per claim 15:

The rejection of claim 11 is incorporated, and further, Walters teaches that the computer-readable medium is one selected from the group consisting of a data signal embodied in a carrier wave, a floppy disk, a computer memory, a hard disk, an optical disk, a tape drive, and a CD-ROM. Bytecodes can be executed on any computer system with a virtual machine, therefore, accordingly, Walters anticipates this claim.

Per claim 16:

Walters discloses:

-a code cache ("a hash table for lactating code blocks in the code cache," col 3 lines 35-44)

-an interpreter, the interpreter being arranged to obtain a bytecode ("instruction is executed by the interpreter," col 4 lines 1-4)

-the interpreter further being arranged to determining whether the bytecode is a branch bytecode ("a branch instruction flag that is set true only for qualifying instructions that are branch instructions," col 10 lines 11-36; col 5 lines 10-40)

-to determine when a basic block is present in the code cache when it is determined that the bytecode is a branch bytecode, the basic block including native code ("the hash table to see if a corresponding native code block is already stored in the code cache," col 3 lines 34-64; Fig 2-5)

-wherein the interpreter causes the native code to be executed when it is determined that the basic block is present and the program instruction is a branch instruction ("If so, the native code block in the code cache is executed until an exit instruction in the native code block is encountered," col 3 lines 54-67; Fig 2-5).

Per claim 17:

The rejection of claim 16 is incorporated, and further, Walters teaches that the interpreter is further arranged to interpret the bytecode (col 3 lines 60-67; col 4 lines 1-3) when the determining determines that the basic block is not present in the code cache ("if there is no corresponding native code block is in the code cache," col 3 lines 60-67) and to copy native code corresponding to the bytecode into the code cache when the determining determines that the basic block is not present in the code cache("After the native code is generated, the resulting native code block is stored in the code cache, an entry for the stored code block is generated in the hash table," col 13 lines 5-30) as claimed.

Per claim 18:

The rejection of claim 16 is incorporated, and further, Walters teaches that the interpreter is further arranged to interpret the bytccode (col 3 lines 60-67; col 4 lines 1-

3)when the determining determines that the bytecode is not a branch bytecode ("if there is no corresponding native code block is in the code cache," col 3 lines 60-67).

Per claim 25, it is the computer-implemented method version of claim 2, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 2 above.

Per claim 26, it is another method version of claim 2, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 2 above.

Per claim 27, it is the virtual machine version of claim 2, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 2 above.

10. Claims 1, 11, 16, and 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Adams(U.S. Patent 5,889,996).

Per claim 1:

Adams discloses:

-obtaining a program instruction to be executed by the virtual machine (col 4 lines 53-60)

-determining whether the program instruction is a branch instruction(col 15 lines 45-67; col 16 lines 1-9);

-determining whether a basic block is present in a code cache when it is determined that the program instruction is a branch instruction, the basic block including code that

represtens the program instruction, the code cache being associated with the virtual machine (col 15 lines 45-64; col 12 lines 6-17 and 60-67)

-executing the code included in the basic block when it is determined that the basic block is present in the code cache and the program instruction is a branch instruction (col 12 lines 6-17).

Per claim 11, this is the computer program product version of claim 1, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 1 above.

Per claim 16:

Adams discloses:

-a code cache ("code cache," abstract)

-an interpreter (abstract)

-the interpreter being arranged to obtain a bytecode, the interpreter further being arranged to determining whether the bytecode is a branch bytecode(col 15 lines 45-67; col 16 lines 1-9) and to determine when a basic block is present in the code cache whether it is determined that the bytecode is a branch bytecode, the basic block including native code, col 15 lines 45-64; col 12 lines 6-17 and 60-67)

wherein the interpreter causes the native code to be executed when it is determined that the basic block is present and the program instruction is a branch instruction (col 12 lines 6-17).

Per claim 25:

Adams discloses:

-when the determining determines that the program instruction is not a branch instruction...interpreting the program instruction (col 12 lines 6-25 and 52-67)

-copying code corresponding to the program instruction into the code cache (col 11 lines 33-41; col 12 lines 52-67).

Per claim 26, it is another method version of claim 25, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 25 above.

Per claim 27, it is the virtual machine version of claim 25, respectively, and is rejected for the same reasons set forth in connection with the rejection of claim 25 above.

Response to Arguments

11. Applicant's arguments filed 12/15/2004 have been fully considered but they are not persuasive.

Per claim 1:

The Applicant states that "Walters does not teach or suggest determining whether a basic block is present in a code cache when it is determined that the program instruction is a branch instruction. It should be noted that the basic block includes code that represents the program instruction. Instead, Walters teaches determining if a

conditional branch instruction is the target of another branch instruction within a compilation window (remark 12)."

In response, Walters discloses a branch instruction flag that is set true only for branch instructions (col 10, lines 11-36; col. 5 lines 10-40) and uses the hash table to see if a corresponding native code block to the native branch instruction is already stored in the code cache. If so, the native code block in the code cache is executed (col. 3 lines 54-67). Therefore, it is clear that the native code block represents the native branch instruction in the code cache and Walter's instruction flags are used to determine the types of instructions. This code generation procedures for conditional branch instructions minimize the native code instructions generated by minimizing the number of native code instructions used to handle non-native condition codes (col. 13 lines 40-54). If applicant means anything more, this must be brought out in the claims to further clarify the invention.

Per claims 9 and 25:

Walters does not tech or suggest interpreting the bytecode when it has been determined that the program instruction is not a branch instruction and copying the code into the code cache.

In response, Walters states that if it is determined that the entry point instruction is one of a predefined set of non-native instructions and instructions that causes or could cause execution of an instruction outside the compilation window to be executed by an interpreter, then that instruction is executed by the interpreter (col. 3 lines 54-67;

col. 4 lines 1-20)." Walters also states that storing the code block in the code cache (col. 7 lines 15-27). If applicant means anything more, this must be brought out in the claims to further clarify the invention.

Per claims 11-22:

The applicant states that Walters does not disclose the limitations of claims 11-22, for the reasons set forth in connection with the claims above. As shown above, the rejection of claims 1, 9 and 25 by Walters was maintained, and accordingly, the rejections of claims 11-22 are also maintained.

The applicant fails to discuss the Adams reference applied against the claims 1, 11, 16, 19 and 22, explaining how the claims avoid the reference or distinguish from it. Therefore, applicant's silence has been considered as applicant's admission that Adams discloses all the limitations in those claims.

Conclusion

12. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The examiner can normally be reached on M-F 7:30-4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on 571-272-3719. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

IK

AU 2193

KAKALI CHAKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100